

# MINERALOGICAL ABSTRACTS

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## ORGANIZERS OF ABSTRACTS

*Great Britain:*

DR. C. M. B. HENDERSON,

Dept. of Geology,

The University,

Manchester, M13 9PL.

*America:*

MISS M. HOOKER,

U.S. Geological Survey,

Washington,

D.C. 20242.

- Australia:* DR. N. L. MARKHAM, Dept. of Geology & Geophysics, University of Sydney.
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- Netherlands:* DR. H. KONING, c/o Geological and Mineralogical Inst., Garenmarkt 1b, Leiden.
- New Zealand:* DR. G. A. CHALLIS, N.Z. Geol. Survey, P.O. Box 30368, Lower Hutt.
- Norway:* PROF. I. W. OFTEDAL, Institutt for Geologi, Universitetet, Oslo.
- Pakistan:* DR. F. A. SHAMS, University of the Punjab, Lahore, West Pakistan.
- Portugal:* DR. C. MATOS ALVÉS, Laboratório de Estudos Petrológicos e Palaeontológicos do Ultramar, Lisbon-1.
- South Africa:* PROF. E. S. W. SIMPSON, Dept. of Geology, University of Capetown, Rondebosch.
- Spain:* PROF. M. FONT-ALTABA, Dept. Cristalografía y Mineralogía, Universidad, Barcelona.
- Sweden:* PROF. SVEN HJELMQVIST, Mineralogisk-Geologiska Institution, Universitet, Lund.
- Switzerland:* PROF. DR. TH. HÜGI, Mineralog-Petrograph Institut, Sahlistrasse 6, Bern.

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Place-names are, in general, in the form used in the Columbia-Lippincott Gazetteer of the World (1952 edition); alternative forms are given on occasion.

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## ORGANIZATION OF ABSTRACTS

Arising from a decision taken at the meeting of the INTERNATIONAL MINERALOGICAL ASSOCIATION in Copenhagen in 1961 the Mineralogical Societies of America and Great Britain agreed to issue a joint statement to National Societies adhering to the Association inviting each Society to organize contributions of abstracts of papers published in the journals of its country on subjects relevant to *Mineralogical Abstracts*. This invitation was issued and has brought a gratifying response. Members of Societies which have agreed to co-operate in this way are entitled to receive *Mineralogical Abstracts* for their personal use at a reduced rate of subscription in application *which must be made through their National Society*. The countries now co-operating include: AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CZECHOSLOVAKIA, DENMARK, EGYPT, FINLAND, GERMANY, INDIA, ISRAEL, ITALY, JAPAN, NETHERLANDS, NEW ZEALAND, NORWAY, PAKISTAN, PORTUGAL, SPAIN, SWEDEN, SWITZERLAND. Individual mineralogists and petrologists in countries not represented in the Association, or not yet co-operating through their National Society, provide abstracts from the literature of ARGENTINA, BRAZIL, KENYA, MEXICO, and SOUTH AFRICA.

## ABSTRACTORS

Contributors to this volume of *Mineralogical Abstracts* are:—

Alves, C. A. de Matos (M.A.), *Portugal*; Andreasson, P. G. (P.G.A.), *Sweden*; Atkins, F. B. (F.B.A.), *Gt. Britain*; Bain, J. A. (J.A.B.), *Gt. Britain*; Ball, D. F. (D.F.B.), *Gt. Britain*; Barker, F. (F.B.), *U.S.A.*; Bayliss, P. (P.B.), *Canada*; Botinelly, T. (T.B.), *U.S.A.*; Breger, I. A. (I.A.B.), *U.S.A.*; Bryant, B. (B.B.), *U.S.A.*; Burns, R. G. (R.G.B.), *Gt. Britain*; Butler, B. C. M. (B.C.M.B.), *Gt. Britain*; Challis, G. A. (G.A. Ch.), *New Zealand*; Champness, P. E. (P.E.C.), *Gt. Britain*; Chinner, G. A. (G.A.C.), *Gt. Britain*; Chiplonkar, G. W. (G.W.C.), *India*; Clark, J. R. (J.R.C.), *U.S.A.*; Danchin, R. V. (R.V.D.), *South Africa*.

Erlank, A. J. (A.J.E.), *South Africa*; Fejer, E. E. (E.E.F.), *Gt. Britain*; Ferguson, R. B. (R.B.F.), *Canada*; Fleischer, M. (M.F.), *U.S.A.*; Fuller, A. O. (A.O.F.), *South Africa*; Gait, R. J. (R.J.G.), *Canada*; Gavish, E. (E.G.), *Israel*; Gottfried, D. (D.G.), *Germany*; Greenland, L. P. (L.P.G.), *U.S.A.*; Häberle, H. (H.Hb.), *Austria*; Hall, A. (A.H.), *Gt. Britain*; Hansen, J. (J.H.), *Denmark*; Hartman, P. (P.H.), *Netherlands*; Henderson, C. M. B. (C.M.B.H.), *Gt. Britain*; Henley, K. J. (H.K.J.), *Gt. Britain*; Hooker, M. (M.H.), *U.S.A.*; Howie, R. A. (R.A.H.), *Gt. Britain*; Hutchison, R. (R.H.), *Gt. Britain*; Hytönen, K. (K.H.), *Finland*.

Japan, Min. Soc. (M.S.J.), *Japan*; Johnson, P. W. (P.W.J.), *U.S.A.*; Jones, B. F. (B.F.J.), *U.S.A.*; Kallio, P. (P.K.), *Finland*; Klemm, D. (D.K.), *Germany*; Koning, H. (H.Ko.), *Netherlands*; Kostov, I. (I.K.), *Bulgaria*; Kubach, I. (I.Kb.), *Germany*; Kühn, R. (R.K.), *Germany*; Kurzweil, H. (H.K.), *Austria*; Le Bas, M. J. (M.J.Le B.), *Gt. Britain*; Leonard, B. F. (B.F.L.), *U.S.A.*; Love, L. G. (L.G.L.), *Gt. Britain*; McHardy, W. J. (W.McH.), *Gt. Britain*; Markham, N. L. (N.L.M.), *Australia*; Marmo, V. [1914–1969] (V.M.), *Finland*; Mathias, F. C. M. (M.M.), *South Africa*; Micheelsen, H. (H.M.), *Denmark*; Miesch, A. T. (A.T.M.), *U.S.A.*; Milne, A. A. (A.A.Mn.), *Gt. Britain*; Mitchell, R. S. (R.S.M.), *U.S.A.*; Moorbath, S. (S.M.), *Gt. Britain*; Moore, J. McM. (J.McM.M.), *Gt. Britain*; Morton, R. D. (R.D.M.), *Canada*.

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Tell, Inge (I.T.), *Sweden*; Tilling, R. I. (R.I.T.), *U.S.A.*; Töpper, W. (W.T.), *Germany*; Traill, R. J. (R.J.T.), *Canada*; Upton, B. G. J. (B.G.J.U.), *Gt. Britain*; Vallance, T. G. (T.G.V.), *Australia*; Walsh, J. N. (N.W.), *Gt. Britain*; Ward, J. H. W. (J.H.W.W.), *South Africa*; Watters, W. A. (W.A.W.), *New Zealand*; Weber, J. N. (J.N.W.), *U.S.A.*; Weibel, M. (M.W.), *Switzerland*; White, W. A. (W.A.Wh.), *U.S.A.*; Wieseneder, H. I. (H.I.W.), *Austria*; Wilcox, R. E. (R.E.W.), *U.S.A.*; Wilkins, R. W. T. (R.W.T.W.), *Australia*; Yaalon, D. H. (D.H.Y.), *Israel*; Young, E. J. (E.J.Y.), *U.S.A.*; Zemann, J. (J.Ze.), *Austria*; Zimmerle, W. (W.Z.), *Germany*.

## ERRATA

## Mineralogical Abstracts, vol. 21

## Abstract number

- 70-85            r.h. column; second Bischoff, *for* goethite *read* goethite  
70-92            *for* 76-92 *read* 70-92  
70-109          *for* hectonite *read* hectorite  
70-116          line 2 *for* course *read* coarse  
70-183          *for* space group R3 *read*  $R\bar{3}$   
70-312          *for* hydrotherma *read* hydrothermal  
70-473          *for* recent *read* Recent  
70-551          *for* Rumsdorf *read* Ramsdorf  
70-669          *for* De Camargo, G. R. *read* W. G. R.  
70-820          *for* ancyllite *read* ancylite  
70-1134        *for* Dokl. Acad. Sci. U.S.S.R., 171 *read* 172  
70-1502        *for* Derra de Magé *read* Serra de Magé  
70-1543        *for* Ginevro *read* Ginervo  
70-1776        *for* Delibras *read* Delibrias  
70-2143        *for* Shaskin *read* Shashkin  
70-2148        *for* limestone *read* limestone  
70-2887        *for* Kempton, J. B. *read* J. P.  
70-3040        *for* tripoloidite *read* triploidite



# ABBREVIATIONS USED IN REFERENCE TO PUBLICATIONS

Abhdl.	Abhandlungen	Geophys., geofis.	Geophysic-al, -s, &c.	Prosp.	Prospecting
Abstr.	Abstract, -s	Govt.	Government	Publ.	Publication(s), published
Abt.	Abteilung				
Acad., Accad., Akad.	Academy, & equiv.	Hdbh.	Handbuch	Rasv.	Razvedka=survey
Adv.	Advancement			Rec.	Records
Agric.	Agricultural, -e	Illustr.	Illustrat-ed, -ions	Ref.	References, referata
Anal.	Anal-y-st, -tical, &c.	Imp.	Imperial	Rend.	Rendiconti
Ann., An.	Annals, Anales, & equiv.	Industr.	Industr-ial, -y	Repb.	Republic
Anorg.	Anorganisch	Inform.	Information	Rept.	Report(s)
Appl.	Applied	Inst.	Institute, institution, & equiv.	Res.	Research
Arch.	Archives	Instr.	Instruments	Reserv.	Reserves
Asoc., Assoc.	Association, & equiv.	Int.	Interior	Rescrs.	Resources
Astron.	Astronomical	Intern.	International	Rdsch.	Rundschau
		Invest.	Investigations	Rev.	Review
Bd.	Band	Issl.	Issledovaniye=investigation	Roy.	Royal, & equiv.
Beitr.	Beitrag	Ist.	Istituto	Sborn.	Sbornik=magazine
Ber.	Bericht-e	Izd.	Izдание=publication	Sch.	School, Schule
Berg.	Bergwesen	Izvest.	Izvestiya	Sci.	Science
Bol., Boll., Bull.	Bulletin, & equiv.	Jahresb.	Jahresbericht	Sect.	Section
Bur.	Bureau	Jahr.	Jahrbuch	Sedim.	Sedimentary
		Jorn., Journ.	Journal, & equiv.	Ser., sér.	Series, & equiv.
Ceram.	Ceramic, & equiv.			Serv.	Service
Chem., Chim.	Chem-i-cal, -stry, & equiv.	Khim.	Khim-ie, &c.	Sitzb.	Sitzungsbericht
Cien.	Ciencia, -s	Kl.	Klasse	Skr.	Skrift, -en, -er
Circ.	Circular	Krist.	Kristallographie, &c.	Soc.	Society, & equiv.
Cl.	Classe			Sondbd.	Sonderband
Com.	Comisión			Spec., spez.	Special, & equiv.
Comm.	Commission	Lab.	Laboratory	Stand.	Standard(s)
Conf.	Conference, & equiv.	Lit.	Literary	Stn.	Station
Congr.	Congress, & equiv.			Suppl.	Supplement
Contr.	Contributions	Mag.	Magazine	Surv.	Survey, -or
C.R.	Comptes Rendus	Mat., Math.	Mathematical, & equiv.	Symp.	Symposium
Crist., Cryst.	Crystallograph-ical, -y & equiv.	Medd.	Meddelelser	Tab(s).	Table(s), tabellen
		Mem., Mém.	Memoir, -s, & equiv.	Techn.	Technological, -y
		Metall.	Metallurg-ical, -y	Tids(s)kr.	Tids(s)krift, -en
Dept.	Department, & equiv.	Min.	Mineralog-ical, -ist, -y	Tijdschr.	Tijdschrift
Diss.	Dissertation	Misc.	Miscellaneous	Trab.	Trabajos
Divn.	Division	Mitt.	Mitteilungen	Trans.	Transactions
Dokl.	Doklady=C.R.	Mh.	Monatsheft	Transl.	Translat-ed, -ion
		Mus., Muz.	Museum, & equiv.		
Econ.	Economic	Nac., Nat.,	National, & equiv.	U.A.R.	United Arab Republic
Educ.	Education	Naz.	Natur-, -alist, & equiv.	Uch.	Uchenyye=learned
Eng.	Engineering	Natur.	Naturwissenschaft, & equiv.	Ucheb.	Uchebnyi=teaching
Exped.	Expedition	Natur-w, -v.		Unders.	Undersögelse, undersökning
Exper.	Experimental			Univ.	University, & equiv.
Expl.	Exploration				
		Obraz.	Obrazovanie=education	Verhdl.	Verhandlungen
		Obshch.	Obshchestva=society	Vidensk.	Videnskaps
Fac.	Faculty			Volc., Vulk.	Volcanolog-ical, -y, &c.
Fig(s).	Figure(s)	Petr.	Petrolog-ical, -y, & equiv.	Vses.	Vsesoyuznyi=All-Union
Fis.	Fisicale, fisico	Petrof.	Petroleum	Vyshh.	Vyshhikh=higher
Fören.	Föreningen	Phil.	Philosophical, &c.		
Förh.	Förhandlingar	Photos.	Photographs	Wiss.	Wissenschaft
Fortsch.	Fortschritt, -e	Photomicros.	Photomicrographs		
		Phys.	Physic-al, -s, & equiv.	Zap.	Zapiski=memoirs
Gen.	General	Pl(s).	Plate(s)	Zav.	Zavodskaya=factory
Geol., géol.	Geolo-gy, -ical, -ist, & equiv.	Polytech.	Polytechnic, & equiv.	Zaved.	Zavedeni=institution
Gesell.	Gesellschaft	Pract., Prakt.	Practical, & equiv.	Zeits.	Zeitschrift
Geo-chem., chim.	Geochem-i-cal, -stry, &c.	Proc.	Proceedings	Zhurn.	Zhurnal=journal
Geogr.	Geograph-y, ical, &c.	Prof.	Professional	Ztg.	Zeitung



# ABBREVIATIONS AND SYMBOLS

used in the text of abstracts

M.M. .. Mineralogical Magazine : M.A. .. Mineralogical Abstracts : A.M. .. American Mineralogist

## CHEMICAL & CHEMICAL-PHYSICAL

cation-exchange-capacity .. ..	c.e.c.
chemical analysis .. ..	chem. anal.
concentrated .. ..	conc.
differential thermal analysis .. ..	d.t.a.
dilute .. ..	dil.
disintegrations per minute .. ..	d.p.m.
equivalent $U_3O_8$ .. ..	$eU_3O_8$
ethylenediaminetetra-acetic acid .. ..	EDTA
heat of formation (absolute temperature subscript) .. ..	$\Delta H_f$
hydrogen ion conc. acidity .. ..	pH
insoluble residue .. ..	insol. res.
isotopes, e.g. .. ..	$^{40}\text{Ar}$ , $^{40}\text{K}$
loss on ignition .. ..	ign. loss
milliequivalent .. ..	me.
microgramme .. ..	$\mu\text{g}$
million-years .. ..	m.y.
not determined .. ..	n.d.
not found .. ..	nt. fd.
not present .. ..	nil
parts per million .. ..	p.p.m.
rare earths .. ..	TR or RE
standard mean ocean water .. ..	SMOW
strength of solution, normal .. ..	N
— — — molar .. ..	M
substances in ionic state	
anions, e.g. .. ..	$\text{Cl}^-$ , $\text{SO}_4^{2-}$
cations, e.g. .. ..	$\text{K}^+$ , $\text{Fe}^{3+}$
thermogravimetric analysis .. ..	t.g.a.
trace .. ..	tr.
X-ray fluorescence analysis .. ..	XRF

## CRYSTALLOGRAPHIC & STRUCTURAL

Ångstrom unit ( $10^{-8}$ cm) .. ..	Å
crystal axes .. ..	$a$ , $b$ , $c$
— face indices .. ..	(hkl)
— form indices .. ..	{hkl}
— zone indices .. ..	[hkl]
indices of X-ray diffractions .. ..	hkl
intensity, .. ..	$I$
— relative .. ..	$I/I_0$
interplanar spacing .. ..	$d$
mica structural polymorphs .. ..	$1M_1$ , $2M_1$
Siegbahn units .. ..	kX
space group. These words will be written in full	
unit cell, formula units .. ..	Z
— repeat distances .. ..	$a$ , $b$ , $c$
— reciprocal lattice lengths of edges .. ..	$a^*$ , $b^*$ , $c^*$
— interaxial angles	
direct lattice .. ..	$\alpha$ , $\beta$ , $\gamma$
— — — reciprocal lattice .. ..	$\alpha^*$ , $\beta^*$ , $\gamma^*$

## OPTICAL

dispersion, e.g. .. ..	$r > v$
electron microscopy .. ..	EM
extinction angle, e.g. .. ..	$\gamma : c$
infrared .. ..	IR
optic axial angle .. ..	2V
— — plane .. ..	O.A.P.
refractive index, in text .. ..	refr. ind.
— — of isotropic mineral .. ..	$n$

refractive indices	
of uniaxial mineral .. ..	$\omega$ , $\epsilon$
of biaxial mineral .. ..	$\alpha$ , $\beta$ , $\gamma$
sign of biaxiality	
negative .. ..	$2V_\alpha$ or —
positive .. ..	$2V_\gamma$ or +
ultraviolet .. ..	UV

## PHYSICAL

calculated .. ..	calc.
calorie .. ..	cal.
calorie, large .. ..	kcal.
cycles per second .. ..	c/s
degree centigrade .. ..	$^{\circ}\text{C}$
density .. ..	$D$ (quote units)
— , relative, e.g. .. ..	$D_2^{20}$
electron paramagnetic resonance .. ..	e.p.r.
electron spin resonance .. ..	e.s.r.
gramme .. ..	g
hardness .. ..	H.
melting-point .. ..	m.p.
micron ( $10^{-4}$ cm) .. ..	$\mu$
millimicron ( $10^{-7}$ cm) .. ..	$m\mu$
nanometre ( $10^{-7}$ cm) .. ..	nm
natural remanent magnetization .. ..	n.r.m.
pounds per square inch .. ..	lb/in. <sup>2</sup>
pressure .. ..	$P$
soluble .. ..	sol.
specific gravity, terms of reference not known .. ..	sp. gr.
temperature .. ..	$T$
Vickers hardness number .. ..	VHN
wavelength .. ..	$\lambda$

## SYMBOLS

approximately equal to .. ..	$\sim$
equal to .. ..	$=$
equal to or greater than .. ..	$\geq$
equal to or less than .. ..	$\leq$
greater than .. ..	$>$
less than .. ..	$<$
not equal to .. ..	$\neq$
parallel to .. ..	$\parallel$
per cent. .. ..	%
per mille .. ..	$\text{‰}$
perpendicular to .. ..	$\perp$
proportional to .. ..	$\propto$